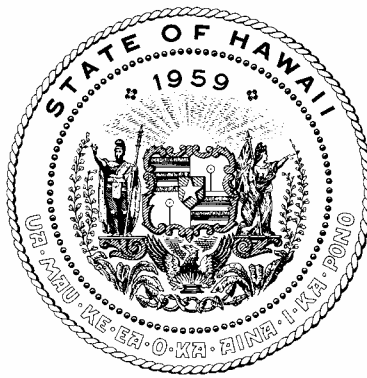


ANNUAL REPORT TO THE TWENTY-SECOND LEGISLATURE

REGULAR SESSION OF 2004

RELATING TO THE FOREST STEWARDSHIP PROGRAM



Prepared by

THE STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
DIVISION OF FORESTRY AND WILDLIFE

In response to Section 195F-6, Hawaii Revised Statutes

Honolulu, Hawaii  
November 2003

ANNUAL REPORT TO THE TWENTY-SECOND LEGISLATURE  
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## RELATING TO THE FOREST STEWARDSHIP PROGRAM

### PURPOSE

This annual report complies with §195F-6, Hawaii Revised Statutes (HRS), and covers specific topics relating to the Forest Stewardship Program (the Program) within the Department of Land and Natural Resources (the Department). Act 195, Session Laws of Hawaii (SLH) 1993 established a dedicated funding source as a percentage of annual Conveyance Tax revenues that is deposited into the Natural Area Reserve Fund. The Department currently has the authority to use \$500,000 per year to fund approved Forest Stewardship projects. This report covers actions taken through June of 2003 as required to implement the statutory provisions of the Program.

### BACKGROUND

The Program became effective in July 1991 through Act 327 of the 1991 State Legislature. The Act authorizes the Department to provide State funds to financially assist private landowners to manage, protect, and restore important natural forest resources on their forested and formerly forested properties. The Program enables private landowners to restore and actively manage important forest resources throughout Hawaii that provide important socioeconomic and environmental benefits and services. Private landowners own approximately one half of Hawaii's remaining forest areas and by establishing the Program, the State recognized that public-private partnerships are essential to the present and future conservation and health of our valued forest resources, and Hawaii's natural environment as a whole. With the demise of Hawaii's primary agricultural industries, sugar and pineapple, the Program is functioning increasingly to encourage investment in forestry as a promising, economically viable land-use alternative that will supply a still small, but rapidly developing hardwood timber industry. Several thousand acres of healthy young high-value timber plantations are now growing on formerly fallow and degraded agricultural land that was reclaimed as a direct result of Program assistance. The majority of landowners who are enrolled in the Program would clearly not have been able to pursue their innovative land-use objectives without the technical and financial assistance that has been offered to them through the Program. In addition, the Program has provided successful land use demonstrations in a variety of environmental and socio-economic situations, encouraging many more landowners to adopt forest management practices on their properties.

The success of the Program is due largely to its inclusion of a wide variety of landowner types and its ability to address a full array of forest management problems and opportunities in a range of local contexts. Management areas currently range in size from 5 to 3,700 acres and management objectives include high-value timber production, agroforest crop production, watershed restoration, native forest restoration, and the provision of educational and recreational opportunities. All funded projects are in some way contributing to the overall health and productivity of Hawaii's forests and enhancing their publicly derived benefits such as economic diversification, local employment opportunities, and the provision of high-value wood for local processing.

## PLANNING and MANAGEMENT

The Department continues to identify ways to more effectively address landowner and State needs while maintaining accountability and furthering the overall, long-term objectives of the Program. The Program's "Five Year Plan", included as Appendix 1, outlines strategies for expanding the Program's environmental and economic impacts, and increasing landowner participation.

The Program follows the State procurement law by publishing in a newspaper of general circulation, an annual legal notice of a "Request for Proposals". The Hawaii Forest Stewardship Advisory Committee reviews all landowner applicant proposals and management plans and recommends those that are eligible and worthy of assistance, to the Board of Land and Natural Resources.

All successful applicants enter into formal Forest Stewardship contract agreements with the Department for a term of no less than 10 years. Contract agreements clearly define applicant responsibilities and provide mechanisms to ensure applicant accountability.

Forest Stewardship contract agreements also require Governor's approval through the Department of Budget and Finance, Chairperson's (of the Board of Land and Natural Resources) approval for multi-term contracts, Department of Accounting and General Services (DAGS), Pre-audit Division formal contract encumbrance approval, employer-employee approval, landowner tax clearance certifications at the start and end of the State fiscal year, and Department of the Attorney General contract approval as to form.

Forest Stewardship contract agreements that involve commercial timber production include a "payback provision" clause that requires Program beneficiaries to return a percentage of Program funds received, to the State, with each commercial timber harvest. In this way, applicants who benefit economically from the Program are able to contribute to its future and assist other applicants with similar objectives. In addition, those who establish commercial forest plantations agree in their contracts, to payback to the State all cost-share assistance received, if they sell their project properties before they harvest the timber that they established with Program assistance.

All landowner participants must commit, in their Forest Stewardship contract agreements, to following the Department's currently approved Best Management Practices (BMPs) when preparing project sites for planting and when harvesting any trees that are planted with Program assistance. All Forest Stewardship projects are currently being inspected to verify compliance with this requirement. If commercial timber production is a management objective, participants must also, in adherence with Chapter 343, HRS, prepare an environmental assessment.

The Department's Division of Forestry and Wildlife (DOFAW) is available to applicant landowners on a continuous basis, providing technical and programmatic guidance as needed. Landowners receive cost-share payments as reimbursements only after they complete and report on specific management practices as described in their approved management plans, and only after practice completion has been confirmed by Department staff following a visit to the project site. Landowners are required to submit written reports in a standard format, with all related cost documentation to DOFAW each six months for the life of their project. All projects are periodically assessed, monitored and audited by DOFAW staff, for adherence to approved budgets, program guidelines and approved management plan specifications.

#### PROGRAM DEVELOPMENT/OUTREACH

The Department has continued to address Program goals and assist applicants with Forest Stewardship Management Plan development and implementation. The Program has also continued in its efforts to educate the public with regards to the important environmental and economic benefits that our forest resources provide, when responsibly managed, and the need for partnerships with private landowners who are responsible for the management of so many of our valuable forest and watershed areas.

The Department continues to work successfully with other federal, state, and county agencies on all major islands to deliver assistance and information to landowners in appropriate forms as needed. The Department's Cooperative Resource Management Forester communicates directly with several landowners each day who have forest management concerns or questions regarding the Program. The Department has distributed several hundred handbooks, fact-sheets and brochures to landowners and government agencies on all islands. In addition, Forest Stewardship workshops are held on each island as needed. These workshops are successful in attracting primarily smaller landowners who may not otherwise have known about or understood the Program. The Department also contributes Program news updates in relevant agency and organization newsletters and periodic press releases, to inform potential landowner participants. The Department will continue to advertise the Program to reach out to landowners with various stewardship objectives on all islands.

The Hawaii Forest Stewardship Handbook is regularly updated and provided to all landowners and resource professionals who are interested in the Program. The Handbook contains information about program eligibility, enrollment and fiscal procedures, management plan requirements and specifications, practice criteria for cost-share assistance, practice specification guidelines, and accomplishment and reporting requirements. The Handbook and other Forest Stewardship information is currently also available online on the Department's web page at [www.dofaw.net](http://www.dofaw.net) in the Forest Stewardship Program link. Stewardship information

has been developed for inclusion in this link and is available for public display. This site has current stewardship project information with pictures, stewardship application procedures, the current Program's Five Year Plan, Annual Report to the Legislature, frequently asked questions (FAQs) about the Program, and other relevant information.

The Program has always strived to emulate environmental stewardship and economically productive land use through well-publicized and closely monitored public-private partnerships. Most recently, the Department constructed a database of all known private forestry projects in Hawaii that provides a forum for information exchange and current case studies in forestry for landowners throughout the State who may be considering forest management options. The database is easily accessible to the public on line on the Department's web page at [www.dofaw.net](http://www.dofaw.net) in the Forest Stewardship Program link.

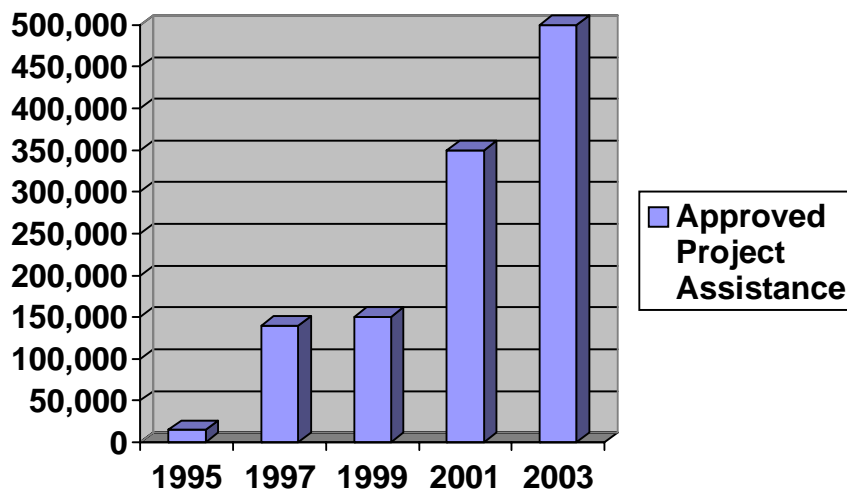
In compliance with Chapter 343, HRS, the Department is able to inform the public regarding the use of public funds to promote private forest stewardship. Notice of quarterly Forest Stewardship Advisory Committee meetings is published in the Office of Environmental Quality Control (OEQC) bulletin to provide an opportunity for public comment and review of agenda items including projects that are being considered for funding.

## ACTIONS

There are currently more than 11,000 acres of private forest land in Hawaii that are being successfully managed for a variety of private and public forest products and benefits as a result of Program assistance. To date, the Department has entered into formal Forest Stewardship contract agreements with 28 landowners on the Islands of Kauai, Oahu, Lanai, Molokai, and Hawaii. In addition, the Department has assisted more than 40 landowners to achieve their forest management objectives with federal Stewardship Incentive and Forestry Incentive Program funds. Most projects have been quite successful and there have been no contractual defaults. For a concise listing of projects, see **Appendix 2**.

Landowners sometimes experience difficulty following their planned practice implementation schedules due to temporary financial hardship or drought conditions that preclude site preparation and planting activities, but bad years are most times by balanced good years during which projects progress more rapidly than planned. Although most Forest Stewardship contract agreements with the State formally terminate after 10 to 15 years, the benefits of the management made possible through the program will continue to accrue for decades. Brief descriptions of all ongoing and maintained projects are included as **Appendix 3**.

The following table illustrates how landowner demand for the Program, and thus funding needs have risen since the Program's establishment.



The forest management accomplishments made possible with assistance from the Program are providing a variety of social and environmental benefits. Participating landowners provide valuable information concerning successful forest management techniques such as site preparation, planting, species selection and seedling maintenance. Through written progress reports, site visits and even casual interactions with participating landowners, projects are generating a wealth of practical information that can be used by other landowners who may be inclined to pursue similar endeavors.

The thousands of acres of forest cover being established and/or maintained, largely on formerly degraded pastures or sugarcane lands, serve to enrich soils, reduce erosion, restore and protect important watersheds, and provide habitats for many wildlife species. Landowners who are producing high-value timber for the local industry are also making a valuable contribution to the development of Hawaii's forest industry, and a more diversified economy.

In addition to cost-share assistance, the Program is providing landowners with a support network, that includes experienced professional foresters and other landowners who have similar ambitious and innovative, yet realistic forest management objectives and are eager to share their forest management experiences.

## PROGRAM CONSTRAINTS

### 1. Project Implementation Delays

For a variety of reasons, some landowners are not able to adhere to their project implementation schedules as defined in their Forest Stewardship contract agreements. Some have problems obtaining tree seedlings or necessary equipment. Some are faced with environmental conditions such as drought, which hinder their progress. Others simply find that they were too ambitious when planning the establishment phase of their project. All amendments to management plan budget schedules currently require Department and Governor's approval. Tax-clearance requirements have also stalled

reimbursements and thus project progress.

## 2. Environmental and Cultural Assessments

The use of public funds for forest stewardship projects trigger the requirement for environmental assessment (EA). Previously, most tree planting activities could be tied to the DOFAW's list of activities that are exempt from the EA requirement. In December of 1996, however, the OEQC ruled that commercial forestry projects could no longer be exempted from the EA requirements. Landowners who plan to harvest the trees they plant with Program assistance are now required to prepare EAs. EAs must include detailed descriptions of tree planting activities, as well as descriptions of proposed harvesting prescriptions. Adherence to this new requirement has proven difficult in some cases, since harvesting plans are usually not prepared until a forest plantation nears maturity and when all necessary information affecting harvesting decisions is obtainable. Also, landowners are routinely asked to explain, in their final EAs how they will mitigate possible impacts on the very resources that they have created as a result of their stewardship efforts. For example, landowners who establish productive, healthy forests on degraded agricultural or pasture land are commonly asked to detail how they will mitigate impacts on wildlife species such as the Hawaiian hoary bat, when doing any future management or harvesting. Since the net impact on all wildlife and natural resources is obviously positive with most Forest Stewardship projects, it seems unreasonable to require that landowners limit or change their plans to completely mitigate any possible adverse impacts. In addition, many landowners feel that it is unreasonable to ask for EAs related to harvesting activities because the Program does not provide cost-share assistance for tree harvesting activities. For areas that currently have threatened and endangered species, the landowner is being advised to look into the Safe Harbor Agreement and Right to Harvest program.

Although this adherence to requirement benefits the Department by providing a mechanism for additional input and increased public awareness, it can create difficulties for landowner applicants already faced with an arduous enrollment process. All forest stewardship projects are planned to provide a net environmental benefit and in many cases the EA requirement seems unnecessary.

## 3. Program Objective Misconceptions

The Program, and some specific projects have faced opposition, because of misconceptions about Program's purpose and objectives. The Program was established to support owners of small and large (non-industrial) forest properties so that they can successfully pursue a wide variety of forest management objectives and to demonstrate the feasibility of integrating what many incorrectly assume are mutually exclusive land use activities. Private landowner participants succeed, and the public benefits, when economic and environmental objectives are sensibly integrated into comprehensive multi-resource management plans, such as those supported by the Program.

The Program recognizes that a diversity of landowner types, and widely divergent scope of responsible management activities is, when considered in sum,

having a significant impact on the overall health of our natural environment and our economy.



**Forest Stewardship Projects as of November, 2003**

| <b>Name of Project/Landowner</b>                             | <b>Date Enrolled</b> | <b>Total Funded</b> | <b>Landowner Match</b> | <b>Location</b>                       | <b>Size (Acres)</b> | <b>Management Practices</b>                               |
|--|----------------------|---------------------|------------------------|---------------------------------------|---------------------|---|
| Allan Batesole<br>(John Edson, Consultant)                   | 25-Feb-00            | \$15,018            | \$24,932               | Anahola, Kauai                        | 7                   | high-value hardwood production, understory crops          |
| Castle & Cooke Resorts, LLC<br>(Darrell Stokes, Manager)     | 25-May-01            | \$750,000           | \$1,683,034            | Lanaihale, Lanai                      | 3,588               | native forest/watershed restoration                       |
| Mary Dougherty<br>(Courtney Murrill, Consultant)             | 28-Jul-01            | \$10,240            | \$11,189               | Ninole, Hawaii,<br>(Hamakua Coast)    | 16.9                | native forest restoration, silvopasture                   |
| Hawaii Rainforest Sanctuary<br>(Norman C. Bezona, Landowner) | 8-Mar-02             | \$190,000           | \$190,000              | Kaloko Mauka, Hawaii                  | 65                  | native forest restoration, education                      |
| Kopua Native Forest<br>(Laura Brezinsky, Manager)            | 22-Jun-01            | \$76,040            | \$179,251              | Kopu Farm Lots, Mountain View, Hawaii | 40                  | native forest restoration, educational Trails             |
| Kainalu Ranch<br>(Kip Dunbar, Landowner)                     | 12-Jan-01            | \$289,186           | 375,339                | Kainalu Ahupuaa Eastern Molokai       | 141                 | high-value hardwood production, native forest restoration |
| Shane & Chris Fox<br>(Charles Wakida, Consultant)            | 30-Apr-98            | \$20,763            | \$35,270               | Papaaloa<br>(Hamakua Coast)           | 17.08               | high-value hardwood production, understory crops          |
| Green & Russo<br>(John Edson, Consultant)                    | 25-Jan-02            | \$34,549            | \$38,539               | Papaaloa<br>(Hamakua Coast)           | 16.51               | high-value hardwood production                            |
| Honouliuli Preserve<br>(The Nature Conservancy)              | 9-Jun-03             | \$1,341,902         | \$670,951              | Wai'anai Mountains                    | 3,692               | native forest/habitat restoration                         |
| Hawaiian Mahogany, Inc.<br>(Bill Cowern, President/Manager)  | 30-Jan-98            | \$708,238           | \$1,762,334            | Koloa, Kauai                          | 1600                | high-value hardwood production                            |
| Hamakua Hardwoods<br>(Christian Giardina, Landowner)         | 11-May-01            | \$29,226            | \$29,226               | Papaaloa                              | 17.15               | High value hardwood production                            |
| H&G Koa Enterprises, Inc.<br>(Gwendolyn Hill, Manager)       | 5-Jun-98             | \$32,828            | \$40,459               | Paauilo, Hawaii<br>(Hamakua Coast)    | 13.47               | Acacia koa timber production                              |

**Forest Stewardship Projects as of November, 2003 (continued)**

| <b>Name of Project/Landowner</b>                    | <b>Date Enrolled</b> | <b>Total Funded</b> | <b>Landowner Match</b> | <b>Location</b>                            | <b>Size (Acres)</b> | <b>Management Practices</b>   |
|---|----------------------|---------------------|------------------------|--|---------------------|---|
| Kalopi Reforestation<br>(Will & Judy Hancock)       | 26-May-94            | \$38,020            | \$38,020               | Kawaihae Uka<br>(North Kohala Mauka)       | 65                  | native forest restoration<br>silvopasture                                     |
| Kapaka Road Partnership<br>(Paul Weissman, Manager) | 25-Mar-98            | \$41,720            | \$54,384               | Princeville Ag.<br>Lots<br>Hanalei, Kauai  | 25                  | high-value hardwood<br>production<br>integrated with house lot<br>development |
| Mark Kimball<br>(Craig Elevitch, Consultant)        | 15-Dec-95            | \$140,144           | \$148,444              | Holualoa,<br>Hawaii                        | 156                 | high value hardwood<br>production<br>native forest restoration                |
| Kaloko Mauka Cloud Forest<br>(several landowners)   |                      | \$87,500            | \$128,450              | Kaloko Mauka<br>(Kona District)            | 95                  | native forest restoration   |
| Kapulena Orchards<br>(Jack Zimmerman, owner)        | 15-Dec-95            | \$42,433            | \$45,816               | Honokaa,<br>Hawaii<br>(Hamakua Coast)      |                     | high-value hardwood<br>production silvopasture/<br>agroforestry               |
| Linda & Michael Larish                              | 11-May-01            | \$12,082            | \$12,082               | Kurtistow,<br>Hawaii<br>(Puna)             | 19.52               | high-value hardwood<br>production   |
| Maikai Ranch<br>(Desmond Twigg-Smith, Owner)        | 12-Jul-96            | \$142,305           | \$154,065              | Holualoa,<br>Hawaii                        | 320.7               | high-value hardwood<br>production<br>native forest restoration                |
| Michael & Kili Matsui<br>(Roger Bason, Consultant)  | 8/13/1993            | \$5,935             | \$5,923                | Wood Valley<br>(Kau District)              | 39.8                | high-value hardwood<br>production native forest<br>restoration                |
| Walter & Kathy Mendes<br>(Bill Sager, Consultant)   | 2/11/2000            | \$19,538            | \$24,322               | Hoolehua,<br>Molokai (north<br>central)    | 18                  | native dryland forest<br>restoration, traditional<br>Hawaiian forest products |
| Molokai Ranch                                       | 1-Jul-92             | \$75,723            | \$75,723               | Puu Nana,<br>Molokai<br>(western<br>south) | 425                 | watershed restoration<br>erosion control                                      |

**Forest Stewardship Projects as of November, 2003(continued)**

| <b>Name of Project/Landowner</b>                      | <b>Date Enrolled</b> | <b>Total Funded</b> | <b>Landowner Match</b> | <b>Location</b>                              | <b>Size (Acres)</b> | <b>Management Practices</b>   |
|---|----------------------|---------------------|------------------------|--|---------------------|---|
| Ookala Community Forest<br>(Laupahoehoe Train Museum) | 27-Sep-02            | \$75,354            | \$119,016              | Ookala,<br>Hamakua<br>Hawaii                 | 33                  | high-value hardwood<br>production<br>native forest restoration          |
| Sam & Tanya Paltin<br>(Rober Bason, Consultant)       | 3-May-94             | \$6,407             | \$6,407                | Wood Valley,<br>Hawaii<br>(Kau District)     | 12                  | high-value hardwood<br>timber production<br>native forest restoration   |
| Rex Provisor<br>(Michael Robinson, Consultant)        | 21-Mar-94            | \$31,185            | \$35,615               | Papa Area,<br>Hawaii<br>(South Kona)         | 17.5                | native forest restoration<br>educational trails                         |
| W.H. Shipman Nene                                     | 1990                 | \$10,000            | \$10,000               | South Hilo                                   | 50                  | nene habitat restoration  |
| Wood Valley Community<br>(several landowners)         | Jul-93               | \$21,550            | \$21,550               | Wood Valley<br>(Kau District)                | 34                  | high-value hardwood<br>production<br>native forest restoration          |
| Umikoa Ranch<br>(David Matsuura, Manager)             | 23-Feb-96            | \$433,373           | \$866,750              | Land of Kaala,<br>Hawaii (upper<br>Hamakua)  | 850                 | Acacia koa timber<br>production<br>native forest/habitat<br>restoration |
| Peter Zirolì<br>(Michael Robinson, Consultant)        | 20-Jan-95            | \$4,460             | \$24,065               | Laupahoehoe<br>Ahupuaa<br>(Hamakua<br>Coast) | 14                  | high-value hardwood<br>production, native forest<br>restoration         |
| <b>PROJECT TOTALS</b>                                 |                      | <b>\$4,685,719</b>  | <b>\$6,811,156</b>     |  | <b>11388.63</b>     |   |



## The Big Island

### Mary Dougherty

Mary is attempting to restore native forest vegetation on seven acres of her property in Manowai`opae Homesteads, near Laupahoehoe, Hamakua District on the Big Island. The former vegetation consisted primarily of non-native pasture grasses and common guava. Mary intends to employ an innovative silvopastoral system to control weeds until the native tree seedlings begin to shade the understory, at which time she will begin planting shorter stature native plants and shrubs. Proposed plantings include ohia lehua (*Metrosideros polymorpha*), koa (*Acacia koa*), kolea (*Myrsine lessertiana*), kopiko (*Psychotria hawaiiensis*), and naio (*Myoporum sandwicense*). The property is typical of many on the Hamakua Coast of the Big Island and it is hoped that Mary's efforts to re-establish native forest vegetation on land made unproductive by decades of agricultural use, might provide a valuable demonstration, inspiring others to do the same.

### Shane and Chris Fox

Shane and Chris have established a 14-acre plantation of various high-value timber species on a former sugar cane field, on the Hamakua Coast above Laupahoehoe. Plantings include *Acacia koa*, pheasant wood (*Cassia siamea*), *Eucalyptus deglupta*, *Eucalyptus Microcorys*, *Flindersia brayleyana*, African mahogany (*Rhaya nyasica*), narra (*Pterocarpus indicus*), teak (*Tectona grandis*), and Australian red cedar (*Toona ciliata*). The various tree species are planted into small, pure, rather than mixed stands to avoid competition between species. The intent is to produce a small forest of quality trees that will provide income on a sustained basis. Shane and Chris also intend to incorporate some under story agroforestry crops such as awa, maile and mamaki that will provide additional, more immediate income.

### Bari Green and Lou Russo

Lou and Bari are establishing a mixed forest stand of high-value tropical hardwood trees on previously unproductive cattle pasture, to supply local markets and woodworkers, while contributing to economic diversification on the Hamakua Coast. As participants in the FS Program, they will also develop information and plant materials useful to other landowners in the area, and throughout the state who may be contemplating similar endeavors on their former pasture or agricultural lots.

It remains a priority of the FS Program, to encourage projects like this that attempt to demonstrate the economic viability of high-value timber production, especially when harvest cycles are longer and the inherent risk associated with the relatively large up-front investment discourages many landowners from pursuing forestry as a potentially lucrative land-use. In areas like Hamakua and Puna, where holdings are being subdivided into relatively small parcels, smaller scale reforestation for high-value timber production may represent one of the best options for reclaiming some of Hawaii's best prime forestland. Also, by supporting smaller scale plantings of these potentially higher-value hardwoods, the Program intends to produce information that will reduce the risk perceived by larger-scale timber producers and investors.

### Hawaii Rainforest Sanctuary

Landowner Norman Bezona is restoring and protecting 62 acres of native mid-

elevation koa-ohia cloud forest above Kailua-Kona on the Big Island.

The project area is located within the Kaloko-Mauka subdivision that is currently zoned as Ag-20. Most of the land within the 2000-acre subdivision has been divided into twenty-acre parcels. Resident agricultural and landscaping activities have already removed approximately 1000 acres of native forest and resulted in the establishment and spread of a variety of invasive non-native plant species similar to those that threaten remnant native forest areas throughout Hawaii. Also, as in many forest areas, feral pigs in the area frequently dig up the forest floor in search of food, destroying native forest regeneration.

Norm is committed to maintaining his property as a healthy, biologically diverse native forest area for demonstration, conservation and educational purposes. He has developed a technically sound plan for strategically removing weeds from the property and replacing them with native vegetation. Transect lines will be established on the property with flagging tape to ensure that all areas are periodically monitored. Norm has already constructed one mile of trails on the property and regularly hosts educational tours for organized civic and community groups including the Boy Scouts, Girl Scouts, 4-H, School, and University classes, and community garden, hiking and environmental clubs. He has also constructed an outdoor education center that includes instructional, library and other facilities, which complement the existing trail system. Future plans include a larger educational facility and an extensive trail network.

### **H&G Koa Enterprises**

H&G Koa Enterprises, under the direction of Gwendolyn Hill, is establishing a 10-acre plantation of genetically superior native *Acacia koa* on degraded pastureland above Paauilo, on the Hamakua Coast of the Big Island. The project's primary objectives are: To produce quality koa timber for local industry consumption; to establish superior seed sources for future koa production; and to research various silvicultural treatments of koa.

All of the koa tree seedlings were planted in the fall of 1998. The area was first fenced to exclude pigs and grazing ungulates. H & G Koa used only genetically superior koa seed stock, collected with assistance from UH-CTAHR and the Hawaii Agricultural Research Center (HARC). The young koa seedlings were planted in various close spacing regimes and managed intensively to achieve high growth rates and high-value crop trees. HARC is collaborating with H&G Koa to closely monitor the plantation's development and keep detailed records for the life of the project.

### **Hamakua Hardwoods**

Hamakua Hardwoods, Inc, under the management of Dr. Christian Giardina and Ingrid Dockersmith, has established a mixed forest stand of high-value tropical hardwood trees on formerly unproductive cattle pasture, to supply local markets and woodworkers, while contributing to economic diversification on the Hamakua Coast. As a participant in the FS Program, Hamakua Hardwoods, Inc. will also develop information and plant materials useful to other landowners in the area, and throughout the state who may be contemplating similar endeavors on their former pasture or agricultural lots. This, and similar commercial timber production projects, though small, can provide an array of benefits including noxious weed suppression, increased biodiversity, wildlife habitat enhancement, enhanced site aesthetics and limited local employment. The Hamakua Hardwoods, Inc. management plan includes net present value and rate of return calculations that illustrate the economic viability of the proposed project.

### **Kaloko Mauka Community**

Four landowners in the Kaloko, Mauka subdivision above the Kona Coast have worked together to improve and protect an 80-acre area of relatively intact native forest. The Lorant, Weiss, Paul and Bezona families continue to remove and control forest weeds, and to construct educational trails through their forest properties.

### **The Kalopi Reforestation Project**

Will and Judy Hancock have established corridors of native forest vegetation on their 60-acre property, located at Kalopi, South Kohala District, on the island of Hawaii. Their primary objective is to incorporate forest biodiversity with their current land use, which is cattle, and sheep pasture. The Hancocks have successfully planted several hundred *Acacia koa'ia* seedlings that they have found to be very drought and wind tolerant. They have also planted naio (*Myoporum sandwicense*) and Indian sandalwood (*Santalum album*) in areas now protected by previously established *Acacia koa'ia* stands and windbreaks. The species *A. koa'ia* has performed particularly well on this site.

The Hancocks have also successfully integrated their livestock operation with their reforestation activities by using their sheep herd as a weed control tool. In a study carried out with the University of Hawaii, CTAHR, they observed that, if managed properly, sheep can be used to graze around certain tree seedlings with minimal damage.

### **Kapulena Orchards**

Landowner Jack Zimmerman is replacing his declining macadamia nut orchard with a productive agroforestry system that integrates high value timber species, improved mac nut trees, a productive silvopastoral area for horses, a native ohia forest and a wildlife habitat corridor. His 42-acre property is located in the ahupua'a of Malanahae, approximately three miles west of Honokaa on the Hamakua Coast of the Big Island. Project manager Seppe Weisemeuller produces most of the seedlings for the project. He is planting trees that will produce fruit and/or timber when grown in relatively open pasture situation. Plantings currently include breadfruit (*Artocarpus communis*), jackfruit (*Artocarpus heterophyllum*), Eucalyptus spp., narra (*Pterocarpus indicus*), koa (*Acacia koa*), and mountain apple (*Eugenia malaccensis*). Throughout the planting area, Seppe is attempting to establish a permanent, productive ground cover including grasses and nitrogen-fixing legumes that will produce forage for his livestock while maintaining soil fertility and controlling erosion. He is attempting to achieve his stewardship objectives without the use of inorganic fertilizers and herbicides.

### **Mark Kimball**

Mark's property is just above Holualoa in the Kona District of the Big Island. As is typical for this area, the property is long, narrow and sloping mauka to makai. Approximately 70 acres of the makai land, has historically been used for pasture and other agricultural practices. Mauka of this is 80 acres of native ohia forest that has been invaded by a number of weed species that are preventing the natural regeneration of native forest species.

On the makai area, Mark has established a plantation forest for long and medium-term, sustainable timber production using organically certifiable methods. Areas were incrementally prepared by grubbing brush into large windrows that follow natural land contours in order to prevent soil erosion. Seedlings were planted in a hexagonal layout that provides for more even spacing than the common rectangular layout. Leguminous cover crops were seeded over planting areas to enrich soils and control weeds that normally compete with young tree

seedlings. Mark has planted mostly higher value timber species including narra (*Pterocarpus indicus*), rosewoods (*Dalbergia* spp.), Australian red cedar (*Toona australis*), koa (*Acacia koa*), teak (*Tectora grandis*), rainbow gum (*Eucalyptus deglupta*), and tallow wood (*E. Microcorys*).

On the mauka area, Kimball is attempting to restore good health to a mature ohia dominated forest by removing and controlling the weeds that compete with native forest species. He removes weeds with a low-impact, accurate excavator that does not disturb the native forest vegetation. He then fills forest gaps with plantings of koa, ohia and sandalwood.

### **Kopua Native Forest Restoration**

Landowners Laura Brezinsky and Sara Barwise are protecting and restoring forty acres of native low elevation ohia forest near Mountain View on the Big Island. The project area is located within the Kopua Farm Lots subdivision that is zoned for agricultural use. The parcels within the subdivision were recently sold to a large number of individual landowners with various intentions for residential or agricultural development. It is likely that increased activity and disturbance in the area will result in the establishment and spread of a variety of invasive non-native plant species similar to those that threaten remnant native forest areas throughout Hawaii. Also, as in many forest areas, feral pigs frequently dig up the forest floor in search of food, destroying native forest regeneration.

Laura and Beth are committed to maintaining their land as a healthy, biologically diverse native forest area for demonstration, conservation and educational purposes. They have developed a technically sound plan for strategically removing weeds from the property and replacing them with native vegetation. They have thoroughly researched trail construction methods used for similar projects and designed a series of trails that will provide access for a variety of demonstration and education activities.

### **Linda and Michael Larish**

Linda and Michael are receiving program assistance to transform an unproductive, degraded pasture area formerly covered with exotic sedges and grasses, into a productive forest area that is to be managed in an environmentally responsible manner for small-scale, sustainable timber production. Site preparation and weed control activities are being carried out so as not to disturb or expose the soil, thus minimizing the potential for erosion. Planned harvesting activities will be incrementally scheduled for the relatively small single species planting blocks. Such incremental harvests are unlikely to produce any significant environmental impacts. Potential positive impacts include the addition of aesthetic beauty and value to the neighborhood, and demonstration of economically viable, environmentally responsible land use.

The management practices being carried out are relatively labor intensive and thus somewhat more costly, because no heavy equipment is being used. The Larishes hope to demonstrate, however, that their type of operation can be profitable, and the economic analysis that they have included in their management plan indicates that what they propose is economically feasible given the higher-value timber species that they are including. Michael and Linda are also working with the Natural Resources Conservation Service to identify suitable under story intercrops such as awa, that will generate more immediate, annual revenues to help support their operation. They say though, that in addition to realizing an economic return for their efforts, they "hope to leave their children with an investment that will give them the resources that they need to build their homes". No other landowners in the Kea'au Ag lots are currently growing trees for timber production and the Larishes want to provide information



that might encourage others to do as they are.

In areas like Puna, where holdings are being subdivided into relatively small parcels, smaller scale reforestation for high-value timber production may represent one of the best options for reclaiming some of Hawaii's forestland.

### **Maikai Ranch**

Landowner Desmond Twigg-Smith is establishing 98 acres of exotic and native hardwood trees for timber production about two miles north of the town of Holualoa on the Big Island. Tree species include koa (*Acacia koa*), toon (*Toona ciliata*), pheasantwood (*Cassia siamea*), bigleaf mahogany (*Swietenia macrophylla*), rainbow gum (*Eucalyptus deglupta*), cocobolo, African mahogany, Spanish cedar, Jacaranda, *Tipuana tipu*, teak, Queensland maple and *Dalbergia* spp. Desmond is also restoring 126 acres of native forest area mauka of his timber plantation by removing weeds and encouraging natural forest regeneration.

### **The Matsuis**

Michael and Kili Matsui have partially reforested their 40-acre upland pasture area in the Wood Valley Homestead District of Ka'u on the island of Hawaii. Their specific objectives include the establishment of a koa-dominant forest ecosystem; the stabilization of critical watershed soils; the enhancement of wildlife habitat and species diversity; the provision of a demonstration site for forest regeneration on former pasture land; and a long term income flow from thinnings and sustainable timber harvesting.

The Matsuis successfully planted a partial windbreak with 50 banana and 90 koa seedlings. They also planted 250 koa seedlings into the existing degraded forest on the upper portion of their property.

### **Ookala Community Forest**

The community is receiving program assistance to improve and maintain the Ookala Community Forest as a demonstration for the Ookala and Hamakua communities that are exploring various land-uses as alternatives to sugar cane and other primary agricultural crops that have historically proven economically nonviable. In addition, the Ookala Community Forest Board intends to restore a lowland native forest area for educational and recreational purposes.

In July 2000, the Board of Land and Natural Resources approved a cooperative agreement involving the Department, the Laupahoehoe Train Museum, the North Hilo Community Council and the Laupahoehoe High School, to establish a demonstration forest at the site to provide long-term access to the community. Now known as the Ookala Community Forest, the area is intended to demonstrate sustainable and economically viable forestry practices.

Approximately 13 acres of the Ookala Community Forest have been planted with high-value tropical hardwood species. The Division of Forestry and Wildlife established three acres in 1993 for research and demonstration purposes, but the funding for the project was eliminated in 1995 and the area was quickly invaded by guinea grass. The Ookala Community has since, completely taken over and greatly extended management of the forest area to include many additional acres and promising timber species. Forest Stewardship Program funding will enable the necessary maintenance of these plantings, as well as the restoration of an additional 8 acres of lowland native forest for demonstration and educational purposes. Employing local expertise and innovative forest restoration techniques, the Ookala Community Forest will serve as a

land-use model for farmers, students, landowners and other members of the public. The project will involve the community to explore the feasibility of producing hardwood timber on the Hamakua coast, using a wide variety of tree species to assess species success and varied maintenance and harvesting methods. The project site will also serve as a “living laboratory” for Laupahoehoe High School students

### **Sam and Tanya Paltin**

Sam and Tanya Paltin are reforesting their 12-acre property in the Wood Valley Homestead District of Ka'u in Hawaii County with native and non-native species including koa (*Acacia koa*), kukui (*Aleutites moluccane*), papala (*Charpentiera spp.*), a'ali'i (*Dodonea viscosa*) and mamani (*Sophora chrysophylla*). Their objectives include the provision of a demonstration site for forest regeneration practices on former sugar plantation land and the generation of a long-term income supplement through hardwood timber production. Plantings have included koa, ohia, mamane, a'ali'i, kukui, Australian red cedar and Indian rosewood.

The Paltins planted 2000 koa, 250 toon and 50 kukui seedlings on approximately 9 acres of the project area. Unfortunately, a neighbor's horses have destroyed some of the seedlings. Approximately 80% of the trees have survived.

### **Rex Provisor**

Rex has successfully restored a 10-acre area of native forest on his property in the Papa area of the South Kona District on the Big Island. He also established a 3-acre woodlot of valuable timber producing species including koa (*Acacia koa*), Queensland maple (*Flindersia brayleyana*), toon (*Toona ciliata*), mamane (*Sophora chrysophylla*), sandalwood (*Santalum ellipticum*), and ohia lehua (*Metrosideros collina*).

Rex's biggest challenge was to remove and control under story weeds such as Christmas berry and guava, and thus to create a favorable environment for natural regeneration and planted under story seedling establishment. He and his family prefer to clear weeds by hand so as not to damage existing native under story plants. Rex successfully planted thousands of hardwood seedlings and native under story plants including kopiko (*Psychotria hawaiiensis*), mamaki (*Pipturus hawaiiensis*) olopua (*Osmanthus sandwicensis*) ti (*Cordyline terminalis*), and 'awa (*Piper methysticum*). He also constructed more than 6,000 feet of educational trails within the forest area that he restored. Tours to the site are especially popular with local school children learning to identify native forest species and their many uses.

### **Umikoa Ranch**

Umikoa Ranch, under the direction of David Matsuura, is reforesting 850 acres of former pastureland between 4000 and 5000 feet in elevation above the Hamakua Coast on the northeastern slope of Mauna Kea. The landowner wants to recreate a large, concentrated tract of healthy koa (*Acacia koa*) forest within its native range.

Pasture areas of 100 to 200 acres are incrementally enclosed to exclude cattle, and then scarified to disturb the dense pasture grass, and to expose mineral soil and viable koa seeds. Seeds exposed to sunlight and moisture germinate within a few days. Various methods of scarification are being tested including bulldozing and burning. The survival of the young koa seedlings depends on their rate of growth compared to the aggressive non-native pasture grasses that quickly reestablish themselves after scarification. Controlled burns are being used in conjunction with targeted herbicide applications to speed seedling germination and stall pasture grass growth. Tree seedlings are being planted where necessary, to fill in gaps and

produce even seedling distribution.

#### **WH. Shipman Nene**

The landowner is maintaining an improved 60-acre nene habitat in a low elevation area near Keaau on the island of Hawaii. Management practices have expanded nesting areas and reduced predator threats. The project has also provided antibiotics and supplemental feed to improve nene health; improved nene loafing areas; and provided nesting structures.

#### **Wood Valley Community**

Three landowners of the Wood Valley Community on the island of Hawaii have cooperated in a reforestation effort to protect a critical watershed area, improve and stabilize degraded soils, enhance forest health, and provide high-value timber. Approximately 50 acres are currently under management.

#### **Peter Zirolì**

Peter Zirolì, a woodworker, is reforesting a 14-acre area of former sugar plantation land above Laupahoehoe on the Hamakua Coast with native and non-native tree species to supply himself with high-value timber. Peter is planting koa (*Acacia koa*), rainbow gum (*Eucalyptus deglupta*), kukui (*Aleurites moluccana*), Australian red cedar (*Cedrela toona*) and narra (*Pterocarpus indicus*). Part of the area is a streamside management zone, where he is replacing invasive weeds with native vegetation including 'ahakea (*Bobea* spp.), olapa (*Cheirodendron trigynum*), and hapu'u (*Cibotium glaucum*). He is also planting a windbreak of Monterey and sugi pine to protect his tree plantations from prevailing northeast winds. Peter wants to maintain the site's natural beauty and rural character, while providing opportunities for others to learn about reforesting former sugar plantation land.

### **Kauai**

#### **Hawaiian Mahogany Company, Inc.**

The Hawaiian Mahogany Company, Inc., under the leadership of Bill Cowern, and made up entirely of local investors, is establishing 1600 acres of plantation forest in the Koloa area of Kauai to produce high-quality timber for local industry consumption. Tree seedling plantings are carried out in four yearly increments of 200 acres each. Most of the project area is being planted with a mix of rainbow gum (*Eucalyptus deglupta*) and tallow wood (*Eucalyptus Microcorys*), both high-value hardwoods with rapid growth rates and proven Pacific-region markets. The remaining 120 acres is being planted with longer-rotation timber species including low-elevation koa (*Acacia koa*), Rhodesian mahogany (*Azelia quanensis*), African mahogany (*Khaya* spp.), Brazilian rosewood (*Dalbergia nigra*), Queensland maple (*Flindersia brayleyana*), and purpleheart (*Peltogyne purpurea*). Cowern is interplanting crop trees with nitrogen-fixing trees and ground-covers to provide organic nutrients, to control weeds and to protect surface soil. He has found that rows of Albizzia trees, between crop trees eliminate the need for inorganic nitrogen fertilizer applications. Bill has also identified potential markets for the Albizzia wood.

#### **Batesole Hardwood Tree Farm**

Allan Batesole is establishing a 7-acre high-value hardwood timber plantation on his

bare, degraded, 7-acre property, - a former papaya plantation, near Mola'a on Kauai. Mr. Batesole's primary objective is to establish a long-term, future source of revenue for his children, while demonstrating to other landowners in the area that forestry is a viable land use alternative, even on very degraded former agricultural land. Allan's species selections include *Cassia Siamea*, *Cordia subcordata*, *Dalbergia sissoo*, *Eucalyptus deglupta*, *Erythrina sandwicensis*, *Khaya senegalensis*, *Tectona grandis*, *Thespesia populnea* and *Toona ciliata*. These species are arranged in the plantation according to their wind tolerance, shade tolerance, growth habit and aesthetics. To achieve the landowner's desire to create a planting that will look more like a forest, and less like a plantation, plantings of different species have been arranged in a patch mosaic.

### **Kapaka Road Partnership**

Architect Paul Weissman is attempting to create a property development model that integrates residential units with a working, high-value hardwood timber-producing forest area. This pilot project consists of five residential units within a Condominium Property Regime (CPR) on a 25-acre land area south of Princeville on the island of Kauai. The final, approved Forest Stewardship Plan has been incorporated as part of each CPR unit's deed, as a covenant that runs with the land. This means that no land transfer can occur without the future landowner/buyer agreeing to, and being bound by, the requirements of the Forest Stewardship Plan. This model could prove especially valuable on Kauai, where subdivision for residential development threatens existing forests in many areas.

## **Molokai**

### **Kainalu Ranch**

Mr. Lance "Kip" Dunbar, owner of Kainalu Ranch, is attempting to reforest several large blocks of land, a total of 141 acres, to begin reclaiming his family property that consists of a large, degraded ahupua'a on the eastern end of Molokai. Continued grazing of this sloping property, in addition to frequent fires, has resulted in increased soil erosion and sedimentation of the near shore reef areas below his property. Kip's primary objective is to restore the watershed and native ecosystem functions of his property with large, incremental plantings of both native and non-native forest species. Non-native forest species will be used primarily as windbreaks and nurse trees to create a favorable environment for the restoration of native vegetation on this very harsh site, where high winds, frequent droughts and periodic fires threaten the success of any such project.

### **Pun Nana Reforestation**

Landowner Molokai Ranch has been successful in reforesting 60-acre section of the degraded Puu Nana watershed on the western end of island near Maunaloa. Project objectives include the stabilization of degraded pasture soils, the establishment of a healthy mixed forest cover, and the provision of improved habitat for area wildlife. The Ranch planted more than 3,500 tree seedlings, mostly Eucalyptus species that have performed well in similar, harsh environments.

### **Walter and Kathy Mendes**

Walter and Kathy Mendes are attempting to restore a dry land native forest on an 8-acre

area of their property on north central Molokai. Their ultimate objectives include the provision of craft and furniture wood to local craftsman and the establishment of a cultural resource that can provide products for Hawaiian medicinal and cultural practices.

## Lanai

### **Lanaihale Watershed Restoration**

Castle & Cooke Resorts, LLC. is partnering with the state, through the Forest Stewardship program to protect and restore the only significant forested watershed on the island of Lanai. Program funds will contribute to the construction of a perimeter fence around the 3,588-acre primary recharge area of the watershed to exclude axis deer that browse on forest foliage, and trample young seedlings, preventing forest regeneration and causing extensive soil erosion. In addition, the Program will provide for the restoration of native forest vegetation on areas that have been degraded due to years of drought, heavy deer traffic, and the invasion of aggressive non-native plant species.

## Oahu

### **Honouliuli Forest Restoration**

The Nature Conservancy of Hawaii (TNCH) proposes to restore and manage native forest resources within specific areas of the Preserve in order to achieve the following primary objectives: 1) Contribute to the restoration of the Waianae Mountains Watershed and others by developing a restoration program that plans, implements and assesses forest restoration techniques that can be applied to a variety of sites throughout Hawaii; and 2) Create a model for community-based restoration by providing opportunities for partners and volunteers to learn about and take part in restoring and managing Hawaii's imperiled biological resources. The restoration program aims to produce landscape-scale results by intensively managing "core" native plant communities and then connecting them with habitat management corridors. By infusing education, outreach and volunteer programs into the forest restoration program at Honouliuli, TNCH intends to build public support for conservation efforts statewide, and develop a force of skilled volunteers to augment the statewide conservation workforce. TNCH will apply specific, intensive native forest restoration and wildlife habitat improvement management practices to approximately 550 acres within the 3,692 acres Honouliuli Preserve. In addition, TNCH will construct and maintain approximately 14,750 feet of trail to provide organized educational and recreational activities. Through its Forest Stewardship Agreement with the Department, TNCH is committed to maintaining the Honouliuli Preserve as a healthy, biologically diverse native forest area for demonstration, conservation and educational purposes through the year 2032.